

### Abstract

A plasma etch process for organic low- k dielectric layers using  $\text{NH}_3$  only, or  $\text{NH}_3 / \text{H}_2$  or  $\text{NH}_3 / \text{H}_2$  gases. A low k dielectric layer is formed over a substrate. A masking pattern is formed over the low k dielectric layer. The masking pattern has an opening. Using the invention's etch process, the low k dielectric layer is etched through the opening using the masking pattern as an etch mask. In a first embodiment, the etch process comprises: etching the low k dielectric layer by applying a plasma power and flowing only  $\text{NH}_3$  gas. In a second embodiment, the etch process comprises: etching the low k dielectric layer by applying a plasma power and flowing only  $\text{NH}_3 / \text{H}_2$  gas. In a third embodiment, the etch process comprises: etching the low k dielectric layer by applying a plasma power and flowing only  $\text{NH}_3 / \text{N}_2$  gas. The invention's  $\text{NH}_3$  containing plasma etch etches organic Low k materials unexpectedly fast. The invention's  $\text{NH}_3$  only etch had a 30 to 80% high etch rate than  $\text{N}_2 / \text{H}_2$  etches of low-k materials like Silk <sup>TM</sup>.